AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) A method for generating user preference data regarding a color characteristic of an image, <u>when an image converted to have a color characteristic that a user prefers with respect to a predetermined reference image is referred to as a preference image, a color characteristic value of the preference image is referred to as a preference value and a color characteristic value of the reference image is referred to as a reference value,</u> the method comprising:

(a) ~~when an image converted to have a color characteristic that a user prefers with respect to a predetermined image is referred to as a preference image and the predetermined image is referred to as a reference image, obtaining an image color characteristic value of the preference image and the reference image~~;

(b) ~~when a color characteristic value of the preference image is referred to as a preference value and a color characteristic value of the reference image is referred to as a reference value,~~ generating {preference value, reference value} which corresponds to a pair of the preference value and the reference value; and

~~(c)~~(b) generating the pair {preference value, reference value} as preference meta-data having at least one feature block,

wherein the feature block comprises:

a block header including a feature identifier corresponding to information identifying a color characteristic; and

at least one feature descriptor including the preference value and the reference value.

2. (Original) The method of claim 1, wherein the color characteristic is at least one of color temperature, brightness, contrast, and saturation.

3. (Original) The method of claim 2, before step (a), further comprising:

providing a plurality of images having different color characteristic values with respect to a predetermined image; and

setting an image that the user has selected from the plurality of images as a preference image, setting an original image with respect to the preference image as a reference image, and generating {preference image, reference image} which corresponds to a pair of the preference image and the reference image.

4. (Original) The method of claim 2, before step (a), further comprising:

installing a unit for controlling a color characteristic of an image in an image display device; and

setting an image of which color characteristic is adjusted by a user using the unit for controlling a color characteristic, as a preference image, setting an original image of which color characteristic is not adjusted by the user, as a reference image, and generating {preference image, reference image} which corresponds to a pair of the preference image and the reference image.

5. (Original) The method of claim 3, wherein the generating {preference image, reference image} is, when the reference image has a contents identifier, generating {preference image, reference image, contents identifier} which corresponds to a combination of the preference image, the reference image, and contents identifier information.

6. (Original) The method of claim 4, wherein the generating {preference image, reference image} is, when the reference image has a contents identifier, generating {preference image, reference image, contents identifier} which corresponds to a combination of the preference image, the reference image, and contents identifier information.

7. (Currently Amended) The method of claim 2, wherein step (b)(a) is, when the reference image has a contents identifier and when a color characteristic value of the preference image is referred to as a preference value and a color characteristic value of the reference image is referred to as a reference value, generating {preference value, reference value, contents identifier} which corresponds to a combination of the preference value, the reference value, and the contents identifier.

8. (Currently Amended) The method of claim 2, wherein a color temperature value in step (a) is obtained by the following steps comprising:

extracting a highlight region from an input color image;

projecting the highlight region on a chromaticity coordinate and calculating geometric representation variables with respect to a shape distributed on the chromaticity coordinate;

estimating a color temperature from the input color image by perceptive light source estimation; and

selecting geometric representation variables around the estimated color temperature from the geometric representation variables and calculating a final color temperature using the selected geometric representation variables.

9. (Original) The method of claim 2, wherein a saturation value in step (a) is obtained by the following steps comprising:

obtaining saturation of each pixel in a HSV color space from an RGB value of a pixel in the image; and

generating a value obtained by adding saturation of the pixels and dividing the added saturation by the number of pixels, as a saturation value.

10. (Original) The method of claim 9, wherein the saturation of the pixel is determined by the following steps comprising:

obtaining maximum and minimum values of the RGB value of the pixel; and

when the maximum value is equal to 0, setting the saturation of a corresponding pixel to 0, and when the maximum value is not equal to 0, setting a value obtained by dividing a difference between the maximum value and the minimum value by the maximum value, as the saturation of a corresponding pixel.

11. (Original) The method of claim 2, wherein a brightness value in step (a) is determined by the following steps comprising:

obtaining luminance Y of each pixel in a YCbCr color space from an RGB value of a pixel in the image; and

generating a value obtained by adding luminance of the pixels and dividing the added luminance by the number of pixels, as a brightness value.

12. (Original) The method of claim 11, wherein the luminance Y of the pixel is determined by Y = 0.299 x R + 0.587 x G + 0.114 x B.

13. (Original) The method of claim 2, wherein a contrast value CV in step (a) is, when Yx is luminance of each pixel in the image and NumberofPixels is the number of pixels in the image, determined using equation 3:

$$CV = \sqrt{[\sum_{x \in (pixels)}(Y_x - BV)^2]/NumberOfPixels}$$

14. (Original) The method of claim 2, wherein step (b)(a) further comprising comprises,

when {preference value, reference value} exists before {preference value, reference value} in step (b)(a) is generated, comparing the pair {preference value, reference value} generated in step (b)(a) with an existing pair {preference value, reference value} and updating the pair {preference value, reference value},

wherein the updating is, with respect to one preference value, when the reference value generated in step ~~(b)~~(a) is compared with the existing reference value and is the same as or similar to the existing reference value, removing the existing reference value.

15. (Original) The method of claim 7, wherein step (b) further comprising, when {preference value, reference value} exists before {preference value, reference value} in step (b) is generated, comparing the pair {preference value, reference value} generated in step (b) with an existing pair {preference value, reference value} and updating the pair {preference value, reference value},

wherein the updating is, with respect to one preference value, when the reference value generated in step (b) is compared with the existing reference value and is the same as or similar to the existing reference value, removing the existing reference value.

16. (Original) The method of claim 14, wherein the updating is, when quantization levels of the two reference values are different, converting a value of high level into a value of low level and comparing with each other, and when image contents identifiers are added to the characteristic value pairs, even though the two reference values are the same as or similar to each other, if the image contents identifiers are different, without removing the existing reference value.

17. (Original) The method of claim 2, wherein the number of the feature blocks is four, and each of the feature blocks corresponds to the four characteristic values.

18. (Original) The method of claim 2, wherein the block header of the feature block represents color temperature if the value of the feature identifier is '0', brightness if the value thereof is '1', contrast if the value thereof is '2', and saturation if the value thereof is '3'.

19. (Original) The method of claim 2, wherein the block header of the feature block further comprises a number-of-descriptors value indicating the number of feature descriptors contained in the feature block.

20. (Original) The method of claim 2, wherein the feature descriptor further comprises:

a Bin number indicating a quantization level of the characteristic value;

a contents ID flag indicating the presence of an image contents identifier; and

a contents identifier if the image contents identifier exists.

21. (Currently Amended) An apparatus for generating user preference data regarding a color characteristic of an image, when an image converted to have a color characteristic that a user prefers with respect to a predetermined reference image is referred to as a preference image, a color characteristic value of the preference image is referred to as a preference value and a color characteristic

value of the reference image is referred to as a reference value, the apparatus comprising:

a color characteristic calculating unit, which, ~~when an image converted to have a color characteristic that a user prefers with respect to a predetermined image is referred to as a preference image and the predetermined image is referred to as a reference image,~~ obtains an image color characteristic value of the preference image and the reference image, and ~~when a color characteristic value of the preference image is referred to as a preference value and a color characteristic value of the reference image is referred to as a reference value,~~ generates {preference value, reference value} which corresponds to a pair of the preference value and the reference value; and

a meta-data generating unit, which generates the pair {preference value, reference value} generated in the color characteristic calculating unit as preference meta-data having at least one feature block,

wherein the feature block comprises:

a block header including a feature identifier corresponding to information identifying a color characteristic; and

at least one feature descriptor including the preference value and the reference value.

22. (Original) The apparatus of claim 21, wherein the color characteristic is at least one of color temperature, brightness, contrast, and saturation.

23. (Original) The apparatus of claim 21, further comprising a first sample image obtaining unit, which sets an image that the user has selected from a plurality of images having different color characteristic values with respect to a predetermined image, sets an original image with respect to the preference image as a reference image, generates {preference image, reference image} which corresponds to a pair of the preference image and the reference image, and outputs the pair to the color characteristic calculating unit.

24. (Original) The apparatus of claim 21, further comprising a second sample image obtaining unit, which, when a unit for controlling a color characteristic of an image is installed in an image display device, sets an image of which color characteristic is adjusted by a user using the unit for controlling a color characteristic, as a preference image, sets an original image of which color characteristic is not adjusted by the user, as a reference image, generates {preference image, reference image} which corresponds to a pair of the preference image and the reference image, and outputs the pair to the color characteristic calculating unit.

25. (Original) The apparatus of claim 23, wherein the generating {preference image, reference image} is, when the reference image has a contents identifier, generating {preference image, reference image, contents identifier} which corresponds to a combination of the preference image, the reference image, and contents identifier information.

26. (Original) The apparatus of claim 25, wherein the color characteristic calculating unit, when the reference image has a contents identifier, further comprises a contents identifier in the pair {preference value, reference value} and generates a combination {preference value, reference value, contents identifier}.

27. (Original) The apparatus of claim 22, wherein the color characteristic calculating unit comprises a color temperature value calculating portion, which obtains a color temperature value, and

wherein the color temperature value calculating portion comprises:

a highlight detecting part, which extracts a highlight region from an input color image;

a highlight variable calculating part, which projects the highlight region on a chromaticity coordinate and calculates geometric representation variables with respect to a shape distributed on the chromaticity coordinate;

a color temperature estimating part, which estimates a color temperature from the input color image by perceptive light source estimation; and

a color temperature calculating part, which selects geometric representation variables around the estimated color temperature from the geometric representation variables and calculates a final color temperature using the selected geometric representation variables.

28. (Original) The apparatus of claim 22, wherein the color characteristic calculating unit comprises a saturation value calculating portion, which obtains saturation of each pixel in a HSV color space from an RGB value of a pixel in the

image and generates a value obtained by adding saturation of the pixels and dividing

the added saturation by the number of pixels, as a saturation value, and

wherein the saturation of the pixel is determined by the following steps

comprising:

obtaining maximum and minimum values of the RGB value of the pixel; and

when the maximum value is equal to 0, setting the saturation of a

corresponding pixel to 0, and when the maximum value is not equal to 0, setting a

value obtained by dividing a difference between the maximum value and the

minimum value by the maximum value, as the saturation of a corresponding pixel.

29. (Original) The apparatus of claim 22, wherein the color characteristic

calculating unit comprises a brightness value calculating portion, which obtains

luminance Y of each pixel in a YCbCr color space from an RGB value of a pixel in

the image and generates a value obtained by adding luminance of the pixels and

dividing the added luminance by the number of pixels, as a brightness value, and

wherein the luminance Y of the pixel is determined by $Y = 0.299 \times R + 0.587 \times$

$G + 0.114 \times B$.

30. (Original) The apparatus of claim 22, wherein the color characteristic

calculating unit comprises a contrast value calculating portion, which, when Yx is

luminance of each pixel in the image and NumberofPixels is the number of pixels in

the image, calculates a contrast value determined using equation 3:

$$CV = \sqrt{[\sum_{x \in (pixels)} (Y_x - BV)^2] / NumberOfPixels}$$

31. (Original) The apparatus of claim 22, further comprising a meta-data

updating unit, which compares the pair {preference value, reference value}

generated in the color characteristic calculating unit with an existing pair {preference

value, reference value}, updates the pair {preference value, reference value}, and

outputs the pair to the meta-data generating unit,

wherein the updating is, with respect to one preference value, when the

reference value generated in step (b) is compared with the existing reference value

and is the same as or similar to the existing reference value, removing the existing

reference value, and the updating is, when quantization levels of the two reference

values are different, converting a value of high level into a value of low level and

comparing with each other, and when image contents identifiers are added to the

characteristic value pairs, even though the two reference values are the same as or

similar to each other, if the image contents identifiers are different, without removing

the existing reference value.

32. (Original) The apparatus of claim 22, wherein the block header of the

feature block further comprises a number-of-descriptors value indicating the number

of feature descriptors contained in the feature block.

33. (Original) The apparatus of claim 22, wherein the feature descriptor further comprises:

a Bin number indicating a quantization level of the characteristic value;

a contents ID flag indicating the presence of an image contents identifier; and

a contents identifier if the image contents identifier exists.

34-42. (Canceled)

43. (Original) An image preference data recording medium on which, when an image converted to have a color characteristic that a user prefers with respect to a predetermined image is referred to as a preference image, the predetermined image is referred to as a reference image, a color characteristic value of the preference image is referred to as a preference value, and a color characteristic value of the reference image is referred to as a reference value, preference meta-data having at least one feature block, the feature block comprising a block header including a feature identifier corresponding to information identifying a color characteristic and at least one feature descriptor including the preference value and the reference value is recorded.

44. (Original) The recording medium of claim 43, wherein the block header of the feature block further comprises a number-of-descriptors value indicating the number of feature descriptors contained in the feature block, and

wherein the feature descriptor further comprises:

a Bin number indicating a quantization level of the characteristic value;

a contents ID flag indicating the presence of an image contents identifier; and

a contents identifier if the image contents identifier exists.

45. (Currently Amended) A computer readable recording medium on which the ~~invention~~ <u>method</u> of claim 1 is recorded as an executable program code.

46. (Canceled)